WELDING PROCEDURE SPECIFICATION

WPS - 2010/1000-8 **REV. NO.:** 1 **DATE:** 8/28/2006 ****APPLICABILITY****

WELDING PROCESS: GTAW **and** SMAW **ASME:** X **AWS:** X **OTHER:**

SUPPORTING PQR: P-WS-213 Z-SM-8-WS-1 P-WS-155-1

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type:	Butt/Groove/Fillet	**Class:**	Full or Partial Penetration
See GWS 1-06 and WFP's for joint details		**Preparation:**	Thermal/Mechanical
Root Opening:	0-1/8"	**Backing:**	Strap, ring, or backweld
Backgrind root:	On double sided joints	**Backing Mat.:**	SS when used
Bkgrd Method:	Grind/chip	**GTAW Flux:** N/A	**Backing Retainer:** N/A

FILLER METALS: **Class:** ER308/ER347 **and** E308/E347

A No: 8 **SFA Class:** 5.4 **and** 5.6 **F No:** 5 **and** 6 **Size:** 3/32 3/32 1/8 5/32

Insert: N **Insert Desc.:** N/A **Weld Metal Thickness Ranges:**

Flux: Type: NA **Size:** N/A **AWS Root Pass:** 0.062 **thru** 0.187

Filler Metal Note: **AWS Balance:** 0.187 **thru** 1.35

ASME Root Pass: 0.062 **thru** 0.187

ASME Balance: 0.187 **thru** 1.35

BASE MATERIAL **P/S No.** 8 **Gr No.** All **to: P/S No.** 8 **Gr No.** All

Spec. SS- Pipe, plate, sheet & strip **Grade:** All **to: Spec.** SS- Pipe, plate, sheet & stri **Grade:** All

Qualified Pipe Dia. Range: ≥ AWS: 4 **ASME:** 0.5

Qualified Thickness Range: AWS: 0.062 **thru** 1.350 **ASME:** 0.062 **thru** 1.350

QUALIFIED POSITIONS: AWS: All **ASME:** All **Vert. Prog.:** Vert. Up

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Preheat Min. Temp.:	50 **°F**	**GAS: Shielding:**	Argon	**or**	
Interpass Max. Temp.:	350 **°F**	**Gas Composition:**	100 / / **%**	0 / 0 / 0 **%**	
Preheat Maintenance:	50 **°F**	**Gas Flow Rate cfh:**	10 **to** 25	0 **to** 0	
PWHT: Time @ °F Temp.	N/A	**Backing Gas/Comp:**	Argon	100 **%**	
Temp. Range:	N/A **°F**	**Backing Gas Flow cfh:**	3 **to** 8		
to	N/A **°F**	**Trailing Gas/Comp:**	N/A	0 **%**	

APPROVAL: Signatures on file at ENG **DATE:** 8/28/2006

WPS NO: 2010/1000-8

WELDING CHARACTERISTICS:

Current: DCEN **and** DCEP **Tungsten Type:** EWTh-2 **Transfer Mode:** N/A

Ranges: Amps 35 **to** 205 **Tungsten Dia.:** 1/16 **Pulsing Cycle:** 0 **to** 0

Volts 12 **to** 25 **Background Current:** 0

Fuel Gas: N/A **Flame:** N/A **Braze temp. °F** 0 **to** 0

WELDING TECHNIQUE: **For fabrication specific requirements such as fittup, cleaning, grinding, PWHT and inspection criteria refer to Volume 2, Welding Fabrication Procedures**

Technique: Manual **Cleaning Method:** Wire Brush, File, Grind, Chip

Single Pass or Multi Pass: M **Stringer or Weave bead (S/W):** S **or** W **Oscillation:** N

GMAW Gun Angle °: 0 **to** 0 **Forehand or Backhand for GMAW (F/B):** N/A

No Pass >1/2": True **GMAW/FCAW Tube to work distance:** N/A

Maximum K/J Heat Input: N/A **Travel speed:** Variable **Gas Cup Size:** #5, 6, 7

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: N/A **Nil-Ductil Transition Temperature:** N/A **Dynamic Tear:** N/A

Comments:

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle	Other
1	GTAW	ER308/ER347	3/32	35 to 95	12 to 16	5 to 9	0 to 0	
2	SMAW	E308/E347	3/32	70 to 95	13 to 16	7 to 11		
3	SMAW	E308/E347	1/8	125 to 160	14 to 18	7 to 11		
4								
5	SMAW	E308/E347	5/32	140 to 205	17 to 23	to		
6								

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.